DOCUMENT RESUME

ED 157 904 TM 007 194

AUTHOR Donald, Janet Gail; Penney, Margaret

TITLE Instructional Analysis Kit.

INSTITUTION McGill Univ., Montreal (Quebec). Center for Learning and Development.

PUB DATE Sep 77
NOTE 47p.; Not available in hard copy due to authors' restrictions
AVAILABLE FROM Centre for Learning and Development, McGill University, 815 Sherbrooke St. West, Montreal, P. Quebec, Canada H3A 2K6 ($1.00)

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Annotated Bibliographies; *College Instruction; Course Content; *Course Evaluation; Curriculum Planning; Evaluation Criteria; Higher Education; Instructional Materials; *Rating Scales; *Self Evaluation; *Student Evaluation of Teacher Performance; Teacher Evaluation; Teaching Procedures; *Teaching Quality

ABSTRACT

Based on a list of 22 elements of the instructional process in five general categories, this kit includes a self evaluation form, a parallel form for the student evaluation of the teacher, a classified and annotated list of reference source materials for self improvement, and brief discussions of why and how to use the kit. The five categories are: course planning (learning system); course content (curriculum); instructional procedures; learning materials (texts, readings, modules, assignments, etc.); and evaluation of learning. Although this kit is designed for college teachers, it could also be used effectively at other educational levels. (CTM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED157904

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

INSTRUCTIONAL ANALYSIS KIT

Janet Gail Donald

and

Margaret Penney

Centre for Learning and Development
McGILL UNIVERSITY

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY
Janet Gail Donald

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

INSTRUCTIONAL ANALYSIS KIT

Janet Gail Donald

and

Margaret Penney

Centre for Learning and Development

McGill University

September 1977

© Janet Gail Donald

Centre for Learning and Development

McGill University

815 Sherbrooke St. W.

Montreal, Quebec.

TABLE OF CONTENTS

	Page
Introduction	1
Self-Evaluation Form	3
How to Analyze Your Instruction	5
Analysis Sheet	7
Outline of Elements of the Instructional Process	9
Explanation of Elements of the Instructional Process	11
Annotated Bibliography of Learning Resources for each Element	21
Alphabetical Bibliography of Learning Resources	39
Supplementary Student Form and Instructions for use.	41

INTRODUCTION

The INSTRUCTIONAL ANALYSIS KIT has been developed to help you analyze your instructional procedures as a first step toward course improvement. The kit consists of a self-evaluation form to enable you to quickly identify the elements of the instructional process which you are most interested in improving. Twenty-two instructional elements are first identified and then more fully explained. An annotated bibliography of learning resources for each element follows.

The kit has been designed so that you can evaluate your own teaching in a minimum amount of time and then identify what you wish to improve in your instructional techniques. Suggestions are provided for ways in which the improvement could be effected. For example, if in your self-evaluation, you identify the need to find out whether your students are grasping the material presented, you can turn to the explanation of the element "presentation of material-pace" which describes ways to gather information about the pace of presentation. The learning resource section of the kit then provides an annotated bibliography of books and articles which deal with how to pace a course to accommodate individual students. Supplementary to the kit is a student evaluation form parallel to the instructor self-evaluation form. With it are instructions on how to administer this form, analyze the data, and interpret the results in conjunction with your own self-evaluation. If you wish to use the student evaluation form, refer to p. 41.

We suggest that you take advantage of the resource persons available in your college or university, especially in the process of identifying and clarifying the instructional elements you wish to improve. Work groups have used this kit successfully to discuss needs and plans for the improvement of instruction.

Research on the Instructional Analysis process has been supported by a Quebec Research Grant.

SELF-EVALUATION FORM

Use this form to evaluate one course that you wish to improve. Indicate your response to each item by recording the appropriate number in the box beside the item.

1	I do this very well
2	I do this fairly well
3	Not applicable to this course
4	I could do this better
5	I could do this much better

☐ 1. At the beginning of the course, I give my students a clear indication of how the course will be organized.

☐ 2. I tell my students what they can expect to learn as a result of taking this course.

☐ 3. At the beginning of the course, I determine what skills and abilities my students have brought to this course.

☐ 4. I start by giving the students a brief outline of the main ideas or general themes to be encountered in the course.

☐ 5. I decide what I want my students to learn and I select my course material accordingly.

☐ 6. As the course progresses, I explain how course topics are related to each other and to the main ideas in the course.

☐ 7. I make sure that the amount of material covered in this course is appropriate to the amount of time a student is expected to spend on the course.

☐ 8. I present the course material so that it is challenging but not overwhelming.

☐ 9. I include variety in the examples and applications of material to provide interest for all students.

☐ 10. I provide a brief agenda at the beginning of each class.

☐ 11. I get information about how well my students understand the material being presented and adjust my rate of presentation accordingly.

☐ 12. I use different ways of presenting material according to what is being taught.

☐ 13. In lectures or discussions, I use questions and other strategies to encourage the students to actively respond to the material.

☐ 14. I make sure there is ample opportunity for students to actively participate in the operation of the course.

☐ 15. I encourage students to pursue special interests in my course.

☐ 16. I make time available for students to consult with me.

☐ 17. I choose the text and other learning materials for this course so that they clarify and highlight material presented to the students.

☐ 18. When necessary, I create my own supplementary learning materials.

☐ 19. At the beginning of the course, I tell the students how their work will be evaluated.

☐ 20. I design test questions to match my learning objectives.

☐ 21. I use test results to see where my students need extra help.

☐ 22. I use measures of how much students have learned to assess the effectiveness of my course.

HOW TO ANALYZE YOUR INSTRUCTION

As you complete each step, check mark the appropriate box. You may find it convenient to remove the Self-Evaluation Form and the Analysis Sheet from the kit to work with. These pages are perforated for this purpose.

- [ ] 1. On the Self-Evaluation Form, place a check mark next to any item which you marked "4" or "5"; these are the items which you consider need improvement.
- [ ] 2. Write the numbers of these questions on the accompanying Analysis Sheet (page 7) in the first column.
- [ ] 3. If there are any other items on the Self-Evaluation Form which you would like to work on, write the numbers of these items in the first column of the Analysis Sheet.
- [ ] 4. The Outline Of Elements Of The Instructional Process (page 9) names each of the items on the Self-Evaluation Form as well as providing you with an overview of the instructional process. Beside each item number you have recorded on your Analysis Sheet, write the corresponding name of the instructional element.
- [ ] 5. Turn to the Explanation Of Elements Of The Instructional Process (pages 11 to 19) and read the explanation of each item you have recorded on your Analysis Sheet.
- [ ] 6. Turn to the Learning Resources section (page 21 to 38) and identify the books, articles, or pamphlets suggested for study in each area of concern.
- [ ] 7. Record on the Analysis Sheet, the books and resources you will use. Then specify what steps you intend to take to improve your instruction.
- [ ] 8. Congratulations for having come this far. Now get to it!

ANALYSIS SHEET

ITEM	INSTRUCTIONAL ELEMENT	STEPS TO BE TAKEN TO IMPROVE INSTRUCTION
- Example -		
4	conceptual themes	1. Outline core material. 2. Read section from book by Ausubel & Robinson. 3. Identify main themes. 4. Plan my presentation such that I keep coming back to these themes periodically and showing the students how each topic fits in with the themes.

OUTLINE OF ELEMENTS OF THE INSTRUCTIONAL PROCESS

COURSE PLANNING (learning system)

1. Course plan
2. Goals and objectives
3. Assessing entry skills

COURSE CONTENT (curriculum)

4. Conceptual themes
5. Selection of content
6. Organization of material
7. Amount of material
8. Level of difficulty
9. Variety and interest

INSTRUCTIONAL PROCEDURES

10. Classroom management - preparation
11. Presentation of material - pace
12. Presentation of material - variety
13. Student-teacher interaction
14. Student participation
15. Responsiveness of teacher to students' interests
16. Availability of teacher

LEARNING MATERIALS (texts, readings, modules, assignments, etc.)

17. Choice of materials
18. Creation of materials

EVALUATION OF LEARNING

19. Evaluation procedures
20. Testing what is taught
21. Evaluation as feedback
22. Amount learned

EXPLANATION OF ELEMENTS OF THE INSTRUCTIONAL PROCESS

COURSE PLANNING (learning system)

1. Course plan: Giving your students a clear plan of how your course has been organized should aid them in developing their own approach to learning. It should also encourage them to become active participants in the teaching/learning process. The outline should include: (a) the aims or goals of the course; (b) main topics in the course and a brief explanation of how these topics are related; (c) what principal instructional methods you intend to use; (d) texts, readings or other learning materials needed in the course; (e) an explanation of how the students' work will be evaluated. The course plan serves as the common framework from which the teacher and students will work.

2. Goals and objectives: The broad goals of the course serve to focus the student's attention on the expected outcomes of the course. The more specific objectives describe for the student what he should be able to do as a result of having taken the course. The specific objectives should include the concepts and relationships which the student is to learn and the skills and abilities which the student is expected to demonstrate by the end of the course. These objectives will serve as study guides for the student. For example, one of the broad goals of an introductory course in political science might be "understanding the differences between democratic and authoritarian government." A specific objective would then be to "describe the defining characteristics of democratic and authoritarian governments and provide examples." An example of a broad goal in a humanities course would be knowledge of Plato's Republic. An accompanying specific objective would be to "compare the views of justice and state the consequences of each view for society."

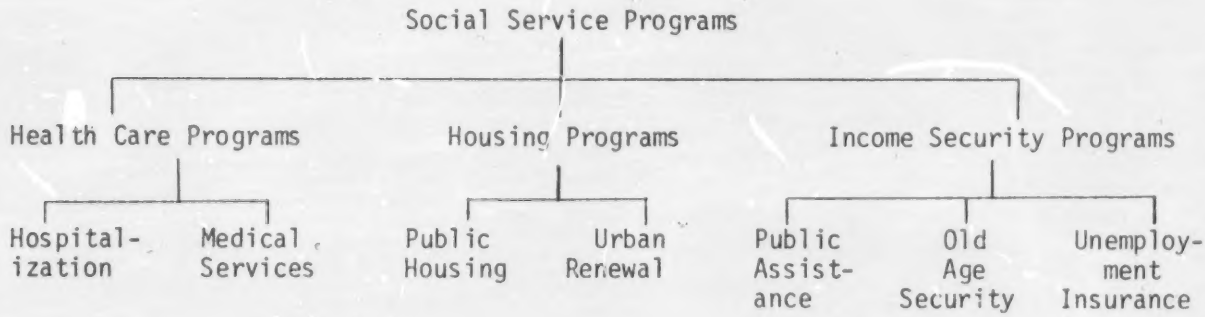
3. Assessing entry skills: Finding out how much students already know about the course content or how many of the objectives they have already mastered can aid the instructor in designing an effective teaching strategy. For example, the instructor of a second-year physiology course might discover through pre-testing that over half of her students do not know the appropriate dyes to use for staining slides. Or, a sociology teacher who had planned to begin his course with a short introduction to quantitative research methods might discover that 80% of the students were already familiar with the methods he intended to present. In both cases, appropriate modifications to the planned instruction can be made.

COURSE CONTENT (curriculum)

4. Conceptual themes: The conceptual foundation for a course consists of the main ideas or themes which integrate the course content. Once the teacher has identified these main themes, course materials can be gathered and filed according to the themes. For an English course in which one of the main themes is "Man's inhumanity to man," a teacher might wish to collect examples from poetry, short stories, drama, and novels to illustrate the breadth of this theme across different forms of expression. Identifying these themes provides the teacher with a useful organizational tool, but perhaps more important, it also facilitates student learning. Once the student grasps the principle ideas he or she will learn new concepts more quickly because they can be related to the conceptual foundation. For example, a student who understands the rule of supply and demand in economics will be able to understand production and marketing more readily. Similarly, a student who has grasped the principle of homeostasis will be better able to understand subsequent examples of body functioning.

5. Selection of Content: Since the instructor is an expert in the content area, he or she must choose from the wide range of possible content the topics which will be included in the course. Certain topics will constitute core material because later learning depends upon knowledge of them. Other topics will be important because they illustrate the wide range of possible applications of the subject area. For instance, in an introductory chemistry course, study of the periodic table would be considered core material. Studying the operation of a smelter plant or of a city filtration system could illustrate possible applications of chemical knowledge. Content should be selected to accomplish the long term learning objectives of the course. If several instructors teach different sections of the same course, they should come to some consensus on at least the core content, leaving the choice of optional material to each individual instructor.

6. Organization of material: A clear presentation of course topics and their relationship to the main concepts in the course should aid students' retention of material. Often a graphic representation of the main ideas in the course can be distributed to students to provide this organization. For example, in a course on social service programs, course material is organized in the following manner:



7. Amount of material: When planning the total amount of material to be included in the course, the instructor should consider the amount of time a student is expected to spend on the course. A rule of thumb is 2 hours work outside for each hour in the classroom. The amount of learning material presented to the student at one time, whether it takes the form of a lecture or a self-instructional package has an important effect on student motivation, learning, and retention. If material is presented in small units, the student experiences successful completion of a task more frequently. This is a strong motivator and results in better learning and retention. However, the units must be large enough to be meaningful and to avoid artificial segmentation of the learning material. For example, a modularized course in introductory psychology might include separate units on classical and operant conditioning. A laboratory instructor who wants to cover three different laboratory procedures might plan to have students practice each procedure immediately after it has been explained. This not only regulates the amount of material presented but also provides the practice necessary for this kind of learning.

8. Level of difficulty: Students appear to learn most effectively when they find the material challenging but not overwhelming. New material should be presented with enough examples to make the newly acquired concepts clear and not confusing. When first introducing the concept of iambic pentameter, for example, an English instructor would be wise to present several clear cut examples of this concept from different poets. As well, the instructor might present examples of other types of meter, so that the distinguishing characteristics of the concept can be identified. As students show they grasp the basic idea, more complex examples may be introduced.

9. Variety and interest: The wider the variety of illustrations, approaches, and applications of course material, the greater the number of students who will be reached. In the field of law, for example, the concept of blame might be treated in a number of different contexts, such as automobile accidents, crimes of passion, white-collar crime, or breach of promise suits.

INSTRUCTIONAL PROCEDURES

10. Classroom management - preparation: An agenda or general plan-of-action prepared before each class meeting is a useful guide for both instructor and students. Laboratory instructors in the physical sciences use this approach by distributing to students prior to a lab a summary of the steps to be carried out in an experiment. This general strategy, with appropriate modifications, can be applied to many different kinds of class meetings, including lectures, seminars, and discussion sessions. The agenda should be flexible and should be based on the specific course objectives. Students should be able to follow the agenda and relate it to the overall course plan.

11. Presentation of material - pace: A certain amount of flexibility in pace is needed to accommodate students' reactions to and ability to learn course materials. New material should be presented with frequent opportunities for feedback from students. Many instructors accomplish this goal by taking a few minutes after the presentation of new material to pose a problem or question, allow students to write down a brief answer and collect these to see if students understood. Others, as a regular part of each course meeting, ask students to fill out a feedback sheet on which they note concepts or ideas discussed in class that day which are still not clear to them. Both techniques allow the instructor to gauge student understanding and adjust the rate of presentation to it.

12. Presentation of material - variety: Careful fitting of the mode of presentation to the topic being treated can result in more effective learning. A wide variety of techniques (including tutorials, modules, video-tapes, cassettes, slides, graphics, student presentations, field trips, etc.) should be considered for their presentation effectiveness. An audio-visual method might be best for presenting the principles of electrical conduction but a discussion session might be more appropriate for exploring the practical applications of these principles. A role-playing situation might be the most appropriate way to present principles of interpersonal counselling.

13. Student-teacher interaction: One way in which the teacher aids student learning is by animating the learning process and by providing opportunities for students to actively respond to the material they are learning. For example, the teacher invites questions on a new concept, or encourages students to question each other in groups while he or she circulates and provides help where needed. A physics teacher might explain a new principle and ask students to think of possible applications of it. A computer science instructor might explain a new programming procedure and then ask students to solve a problem using it. A writer of self-instructional materials might periodically insert questions which require the student to synthesize what has been read and formulate an answer before continuing.

14. Student participation: Students can be expected to learn more from a course in which they actively participate. If given responsibility for certain course activities and decisions regarding presentations, quizzes, assignments, or projects, students will feel more involved in the course. Peer tutoring, too, fosters greater participation. Positive attitudes arising from this involvement usually result in better learning.

15. Responsiveness of teacher to students' interests: Encouraging students' particular interests in course topics by providing sources of specific information to them should stimulate a continuing interest in the subject matter. Teachers who take the time at the beginning of a course to determine the interests of their students and who then respond to these interests find that students develop a very positive attitude toward the course and the subject matter in general. For example, a teacher of introductory biology might discover that one class is made up almost exclusively of nutrition majors. This information would allow the teacher to develop explanatory examples relevant to their interests.

16. Availability of teacher: Students often wish to follow up a special interest or seek clarification of difficult concepts by contacting the teacher for resources. Student-teacher contact can be arranged in many ways. Allowing time before or after course meetings and maintaining clearly stated office hours are two possibilities.

LEARNING MATERIALS

17. Choice of materials: Texts and readings should provide background and explanations of the important topics of a course. They should also provide material for enrichment and remedial purposes. For example, in a course on historical research, readings should include methods of research and an indepth study of a particular case so that students have both a basic procedure to follow if they are uncertain about research methods, and descriptions of alternative approaches that the more advanced student could use.

18. Creation of materials: In cases where no text or readings can be found which cover a certain topic adequately (e.g., a new discovery), an instructor may want to create some learning materials. Supplementary materials may take the form of a one-page informational handout or a more elaborate self-instructional package. Care must be taken in the preparation of such materials to ensure their clarity and usefulness. Students learn a lot and enjoy learning from well-constructed modules, for example.

EVALUATION OF LEARNING

19. Evaluation procedures: The methods used to evaluate student learning should be in keeping with the goals and objectives of the course as stated in the course plan. The procedures for the evaluation of learning should be announced at the first class meeting, should be a part of the course plan, and should be repeated at regular intervals.

20. Testing what is taught: What is tested should be what has been taught. The method of testing must match the learning objectives. For example, if one of the objectives of a course is that students be able to diagnose childhood diseases, an appropriate test of this objective would provide real or simulated cases and would ask students to provide a diagnosis. It would not be appropriate to ask students to write essays about various diseases. If, in an elementary statistics course, one of the objectives is that students be able to calculate a correlation coefficient, then an appropriate test of that objective would be to have students actually calculate the statistic from a given set of data, and not merely to define "correlation coefficient."

21. Evaluation as feedback: The most important use of the evaluation procedure is to show both students and teacher where learning has occurred and in what areas more work is required. Specific feedback allows the student to concentrate on the specific areas where further study is needed. Frequent measurement of the amount learned also allows the teacher to gauge the effectiveness of the instructional strategies being used and to make changes as necessary.

22. Amount learned: Assessing how much students have learned at the end of a course yields valuable information regarding the effectiveness of a course. Comparing knowledge before and after a course (pre- and post-testing) is one way of measuring how much has been learned. Determining how much is retained and applied in later courses is another way.

ANNOTATED BIBLIOGRAPHY OF LEARNING RESOURCES

These learning resources have been selected with the intention of providing you with the most useful and practical books and articles available. The books and articles considered to be first choice in each section are asterisked (*). The bibliography is designed so that references which apply to the general area are noted first, then references for each element are given. These resources as well as others are available at the Centre for Learning and Development.

COURSE PLANNING

The references following immediately are generally applicable to the problem of planning instructional sequences:

*Deterline, W.A., & Lenn, P.D. Coordinated instructional systems. Palo Alto, California: Sound Education, Inc., 1972, pp. 1-43.

Provides a step-by-step approach to planning, constructing, and validating instructional materials.

Donald, J.G. Before instruction: Preparatory steps and checks. Learning and Development, 1975, 6 (5).

This newsletter provides a checklist of important points to consider when planning a course of instruction. Information from three sources: students' entering skills; organization of instruction; and goals of instruction need to be coordinated for effective course planning.

Eriksen, S.C. Motivation for learning. Ann Arbor, Michigan: University of Michigan Press, 1974, pp. 26-42.

A discussion of general guidelines to keep in mind when deciding what goals to pursue in a course of instruction. He also discusses how, with these objectives in mind, one can plan appropriate instructional arrangements and evaluation schemes.

*Gagné, R.M. Essentials of learning for instruction. Hinsdale, Illinois: Dryden Press, 1974, pp. 97-122.

In this chapter, Gagné discusses how to plan instruction for an overall course and for individual units within the course.

Kemp, J.E. Instructional design. Belmont, California: Lear Siegler, Inc., 1971. (130 pp.)

A brief to-the-point guide to planning instructional sequences.

McKeachie, W.J. Teaching tips: A guide book for the beginning college teacher. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 5-10.

This book is a source of information for all college teachers, despite its title. In his second chapter, he discusses a number of questions such as how to choose a text, and what teaching method to use, which must be considered in course planning.

1. Course Plan

The following references give specific ideas on how to construct a course plan (outline):

Deterline, W.A. & Lenn, P.D. Coordinated instructional systems. Palo Alto, California: Sound Education, Inc., 1972, pp. 2-5.

This article stresses the reasons for and importance of giving students a general outline to tell them where they are going in a course.

McKeachie, W.J. Teaching tips: A guide book for the beginning college teacher. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 13-14.

A brief discussion of the important items to include in a course plan or outline.

A number of course outlines from courses given at McGill are available as examples from the Centre for Learning and Development, McGill University.

2. Goals and Objectives

The references listed below are divided into three categories:

1) those which introduce the topic of objectives and why they are valuable;

2) those which describe how to construct them;

3) those which treat both questions.

Why?

Geis, G.L. Why write and use behavioral objectives? Learning and Development, 1972, 4 (1).

This newsletter explains the potential benefits of using behavioral objectives.

Pascal, C.E. Towards meaningful educational objectives. Learning and Development, 1969, 1 (3).

Shows how stating objectives can help the teacher focus on the important instructional goals and reject the trivial ones.

How?

*Cohen, A. Objectives for college courses. Beverly Hills, California: Glencoe Press, 1970. (140 pp.)

This book contains a variety of materials including: a programmed lesson in writing objectives (chapter 3); a question-and-answer chapter on criticisms and caveats; a sizeable selection of specimen objectives on a great variety of subject matters; and a short but useful annotated bibliography.

Gagné, R.M., & Briggs, L.J. Principles of instructional design. New York: Holt, Rinehart, and Winston, Inc., 1974, pp 75-97.

This book discusses various elements of instructional design. Chapter 5 deals specifically with how to construct objectives for the different kinds of human capabilities a teacher may want students to acquire.

Johnson, R.B., & Johnson, S.R. Assuring learning with self-instructional packages. Don Mills, Ontario: Addison-Wesley, 1973, pp. 2-39.

A learning package in which one learns about objectives while constructing them.

Vargas, J. Writing worthwhile behavioral objectives. New York: Harper & Row, 1972. (175 pp.)

A self-instructional book in which one learns about objectives while constructing them.

How and Why?

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 27-76.

A well designed book which takes the learner through the stages of discovering what objectives are, identifying good objectives, and composing one's own objectives.

Mager, R. Preparing instructional objectives. Belmont, California: Lear Siegler, Inc., 1962. (60 pp.)

A self-instructional book covering the whole area of instructional objectives.

3. Assessing entry skills

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 93-98.

This short section describes the kinds of entry skills an instructor may wish to assess and concentrates on how to use the information thus accumulated.

Donald, J.G. Before instruction: Preparatory steps and checks. Learning and Development, 1975, 6 (5), 4-5.

Discusses several forms a pre-test can take.

COURSE CONTENT

The following references offer a wealth of general information regarding course content and have been divided into two categories: background and immediately applicable.

Background

Ausubel, D.P., & Robinson, F.G. School learning. New York: Holt, Rinehart, and Winston, Inc., 1969. (691 pp.)

This book covers the whole gamut of factors which influence classroom learning. It is an attempt to translate theory and research into practical application. Chapter 6 "Transfer of Learning" and Chapter 11 "Use of Instructional Materials in Optimal Planning" are particularly useful.

A few excerpts from this book will be mentioned below.

Gagné, R.M., & Briggs, L.J. Principles of instructional design. New York: Holt, Rinehart, and Winston, Inc., 1974.(270 pp.)

A practical guide to systematically planning instruction. Special attention is paid to the proper sequencing of material for effective learning. Excerpts from this book have also been suggested for later topics.

Immediately Applicable

*Gagné, R.M. Essentials of learning for instruction. Hinsdale, Illinois: Dryden Press, 1974. (164 pp.)

This book deals in very understandable terms with the whole learning process. The last two chapters are immediately applicable to everyday classroom situations.

Tyler, R.W. Basic principles of curriculum and instruction. Chicago: University of Chicago Press, 1949. (129 pp.)

A very comprehensive book providing good insight into specific ways to arrange learning material to facilitate learning.

4. Conceptual Themes

The following excerpts from the writings of three well-known educators stress the importance of identifying the underlying principles of a content area. These should be used to organize the teaching of a topic most effectively.

Ausubel, D.P., & Robinson, F.G. School learning. New York: Holt, Rinehart, and Winston, Inc., 1969, pp. 166-167 & 319-321.

*Bruner, J. The process of education. Cambridge, Massachusetts: Harvard University Press, 1960, pp. 17-32.

5. Selection of Content

Davis, R.H., Alexander, L.T., & Yelon S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 201-202.

This short section emphasizes the importance of determining the level of skills students have attained when they enter your course. This information will enable you to plan your instructional strategy.

Kemp, J.E. Instructional design. Belmont, California: Lear Siegler, Inc., 1971, pp. 43-46.

A brief but useful discussion with examples of how to choose and sequence subject matter to accomplish your objectives.

Tyler, R.W. Basic principles of curriculum and instruction. Chicago: University of Chicago Press, 1949, pp. 3-62.

This selection discusses ways of answering the question: "What are the most important concepts to include in my course?"

6. Organization of Material

Beard, R. Teaching and learning in higher education. Middlesex, England: Penguin Books, Ltd., 1970, pp. 99-102.

This brief section deals with how to effectively organize lectures. The suggestions given can be adapted to preparation of written materials as well.

*Gagné, R.M. and Briggs, L.J. Principles of instructional design. New York: Holt, Rinehart and Winston, Inc., 1974, pp. 99-120 & 137-157.

A discussion of organization at both the general topic and individual lesson levels, paying special attention to the kinds of organization optimal for learning different kinds of capabilities i.e., information, skills, etc.

Tyler, R.W. Basic principles of curriculum and instruction. Chicago: University of Chicago Press, 1949, pp. 83-103.

A discussion of how to organize learning experiences for effective instruction.

7. Amount of Material

Beard, R. Teaching and learning in higher education. Middlesex, England: Penguin Books, Ltd., 1970, pp. 97-99.

"Content" here is discussed mainly with reference to lecturing, but many of the suggestions made can be interpreted in a broader sense.

McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 7-9.

Gives helpful hints on how to plan and distribute the total amount of material to be covered in a course of study.

8. Level of Difficulty

Ausubel, D.P., & Robinson, F.G. School learning. New York: Holt, Rinehart, and Winston, Inc., 1969, pp. 309-314.

A discussion of how task size, difficulty level and pace of presentation interact to influence the effectiveness of instruction.

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 207-208 & 227-230.

The principle of "fading the prompt" or beginning with easy examples and advancing to more difficult ones is first explained and then illustrated with reference to concept learning.

9 Variety and Interest

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 198-200 & 204-205.

The important learning principles of meaningfulness and novelty are explained and suggestions are given on how to apply them in the classroom.

Gagné, R.M. Essentials of learning for instruction. Hinsdale, Illinois: Dryden Press, 1974, pp. 115-116.

The importance of spaced reviews using a variety of examples is discussed.

INSTRUCTIONAL PROCEDURES

The references immediately following give a general introduction to instructional procedures.

Davis, J.R. Teaching strategies for the college classroom. Boulder, Colorado: Westview Press, 1976. (136 pp)

A thorough treatment of the pros and cons of different teaching methods - including the systems approach, lectures, inquiry training and group processes - and some suggestions on how to choose the appropriate strategy.

*Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 219-299.

Emphasizes that different kinds of learning take place most effectively under different conditions. The authors describe procedures for use in teaching concepts, principles, problem-solving, and perceptual-motor skills.

Deterline, W.A., & Lenn, P.D. Coordinated instructional systems. Palo Alto, California: Sound Education, Inc., 1972, pp. 70-75.

This article presents the rationale for individualized instruction and describes a new role for the teacher as a facilitator of learning.

Gagné, R.M., & Briggs, L.J. Principles of instructional design. New York: Holt, Rinehart, and Winston, Inc., 1974, pp. 121-136.

An overview of the events of instruction, from initially gaining attention and informing the learner of the objectives to assessing performance and enhancing retention.

10. Classroom Management and Preparation

*McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath & Co., 1969, pp. 22-24 & 157-158.

These excerpts are concerned with how to prepare for all class periods with special attention given to lectures, for example, preparing a lecture outline to distribute to students.

Shulman, L. The dynamics of the first class. Learning and Development, 1971, 3 (1).

Gives a number of suggestions on how to handle that most important first class.

11. Presentation of Material - Pace

Ausubel, D.P., & Robinson, F.G. School learning. New York: Holt Rinehart and Winston, Inc., 1969, pp. 311-312.

A general discussion dealing with the rate at which new material should be introduced.

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, p. 207.

The principle of distributed practice is discussed with examples.

Wilson, S.R., & Tosti, D.T. Learning is getting easier. San Rafael, California: Individual Learning Systems, Inc., 1972, pp. 73-89.

These two chapters discuss possible ways to introduce individual pacing, even within a semester system.

12. Presentation of Material - Variety

The references for this section are of two types: those which describe a broad spectrum of approaches (general); and those which focus on one particular teaching method (specific).

General

Beard, R. Teaching and learning in higher education. Middlesex, England: Penguin Books Ltd., 1970, pp. 91-178.

This section is composed of five chapters, one on each of the following: lecturing; small group discussions; laboratory teaching; programmed instruction; and independent study.

Briggs, L.J. Handbook of procedures for the design of instruction. Pittsburgh, Pennsylvania: American Institutes for Research, 1970, pp. 146-155.

Summarizes the strengths and weaknesses of different teaching methods.

Brilhart, J.K. Effective group discussion (2nd ed.) Dubuque, Iowa; Wm. C. Brown, 1974. (185 pp.)

The theory of group processes is translated into practical suggestions for facilitating group discussion.

*Eriksen, S.C. Motivation for learning. Ann Arbor, Michigan: University of Michigan Press, 1974, pp. 159-187.

Covers lecturing, seminars and discussion groups, laboratories, tutorials, independent study, and a brief introduction to the hardware of instruction, that is, computers, television and other media.

*McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 22-119.

This book includes chapters on each of the following: lecturing, discussion, laboratory methods, independent study, programmed learning and computer-assisted instruction, audio-visual techniques, and role playing.

Thornton, J.W., & Brown, J.W. (Eds.). New media and college teaching. Washington, D.C.: National Education Association, 1968. (184 pp.)

This book presents a catalogue of innovative instructional strategies using hardware, for example, television, films, computers, etc.

Wilson, S.R., & Tosti, D.T. Learning is getting easier. San Rafael, California: Individual Learning Systems, Inc., 1972, pp. 51-60.

How to choose the most appropriate display media, for example, pictures, written word, graphs, films, for presenting information.

Specific

Many of these references are newsletters distributed by the Centre for Learning and Development and written by members of the faculty at McGill University. All the entries describe various teaching methods.

Butt, R. The advantages of simulation and gaming as instructional devices: Changing classroom transactions. Learning and Development, 1975, 6 (3).

Dychtenberg, A. Modularized instruction: A selected annotated bibliography. Learning and Development, 1973, 4 (8).

Donald, J.G. Contracting for learning. Learning and Development, 1976, 7 (5)

Donald, J.G. Modular instruction: A resource book. Montreal: McGill University, Centre for Learning and Development, 1977.

Edwards, R. Lectures, tutorials, and seminars. Learning and Development, 1971, 3 (2).

Dychtenberg, A., & Geis, G.L. P.S.I.: An annotated bibliography on an innovative teaching method. Learning and Development, 1973, 5 (2).

Goldschmid, B., & Goldschmid, M.L. Individualizing instruction at the college and university level. Learning and Development, 1973, 4 (7).

Goldschmid, M.L. The learning cell. Learning and Development, 1971, 2 (5).

Roid, G.H. Lecturing: Time for a change? Learning and Development, 1969, 1 (2).

Russel, J.D. Modular instruction. Minneapolis: Burgess Pub. Co., 1974. (134 pp.).

13. Student-Teacher Interaction

Eriksen, S.C. Motivation for learning. Ann Arbor, Michigan: University of Michigan Press, 1974, pp. 150-159.

Discussion of the different roles a teacher may adopt and how these roles influence classroom interaction.

*Geis, G.L., & Pascal, C.E. Consequences of learning. Learning and Development, 1970, 2 (2).

This article discusses ways to bring about positive rewards in the learning situation and how such consequences make instruction more effective.

Goldschmid, M.L. The learning cell. Learning and Development, 1971, 2 (5).

Describes one instructional method, the learning cell, which facilitates greater student-to-student and student-to-teacher interaction.

Kemp, J.E. Instructional design. Belmont California: Lear Siegler, Inc., 1971, pp. 51-71.

This section stresses the importance of active involvement in the learning process and gives practical suggestions on how to bring it about.

Pascal, C.E., & Geis, G.L. Feedback and learning. Learning and Development, 1970, 2 (4).

This article discusses the principle of feedback, both from teacher to student and from student to teacher. Continuous feedback in the learning situation yields better student learning and better instructor performance.

*Shulman, L. The hidden group in the classroom. Learning and Development, 1970, 2 (3).

Having to work with large groups of students is often seen as a handicap by the teacher. This article, however, discusses ways to use the unique characteristics of groups to make learning more effective.

14. Student Participation

Butt, R. The advantages of simulation and gaming as instructional devices. Learning and Development, 1975, 6 (3)

Describes ways to facilitate student participation with the use of instructional games.

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 205-208.

Suggestions on ways to get students to actively participate in the learning situation.

McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 55-57.

Ways to get students to participate in class discussions.

Park, J. & Henchey, N., A simulation exercise for student teachers. Learning and Development, 1973, 4 (5).

Description of one use of simulation in a course for student teachers.

Pascal, C.E. Undergraduates as teachers. Learning and Development, 1970, 1 (8).

In keeping with the belief that you learn something best when you try to teach it to another, this newsletter explores the many possibilities inherent in using students to teach their fellows.

Schermerhorn, S. Peer teaching. Learning and Development, 1973, 5 (3).

This newsletter also explores the use of students as teachers.

Wilson, S.R., & Tosti, D.T. Learning is getting easier. San Rafael, California: Individual Learning Systems, Inc., 1974, pp. 35-41

This chapter suggests many ways to get students involved in the learning process.

15. Responsiveness of Teacher to Students' Interests

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 198-200 & 208-211.

Brief discussions of ways to nurture students' interest in the subject-matter being learned by relating it to their interests and by decreasing the negative consequences of instruction and increasing the positive aspects.

Mager, R.F. Developing attitude toward learning. Belmont, California: Fearon Publishers, 1968. (104 pp.)

Addresses the problem of increasing students' positive or approach tendencies toward learning and decreasing negative or avoidance tendencies.

16. Availability of Teacher

McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 170-175.

Describes reasons for and possible effects of establishing office hours for meeting students.

LEARNING MATERIALS

17. Choice of Materials

Deterline, W.A., & Lenn, P.D. Coordinated instructional systems. Palo Alto, California: Sound Education, Inc., 1972, pp. 28-33.

Discussion of several issues, including how to choose texts and other materials, how to make the best use of a text which has already been chosen for you, and how to prepare other necessary learning materials such as auxiliary readings and practice exercises.

McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 5-10.

Deals with the pros and cons of using a textbook; how to prepare assignments; and choosing the most appropriate methods of presenting material.

18. Creation of Materials

The first three references deal with how to design and prepare self-instructional materials.

Deterline, W.A., & Lenn, P.D. Coordinated instructional systems. Palo Alto, California: Sound Education, Inc., 1972, pp. 28-33.

Johnson, R.B., & Johnson, S.R. Assuring Learning with Self-Instructional packages. Don Mills, Ontario: Addison-Wesley, 1973, pp. 43-95.

Russel, J.D. Modular instruction. Minneapolis: Burgess Pub. Co., 1974. (134 pp.)

Vargas, J. Writing worthwhile behavioral objectives. New York: Harper & Row, 1972, pp. 145-171.

Although this book is principally concerned with objectives, this particular chapter outlines a step-by-step procedure for preparing units of instructional materials. Brief examples from various disciplines are given.

EVALUATION OF LEARNING

Evaluation of learning means measuring the success of teachers as well as students. The references given below address themselves to both these aspects of evaluation.

*Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 79-127.

This chapter discusses the measurement of student performance, including the properties of a good test, as well as the evaluation of the instructional system for the purpose of improving it.

Donald, J. The evaluation of learning. Learning and Development, 1976, 8 (2).

Discusses the rationale for and methods of measuring student learning gains.

*Gagné, R.M., & Briggs, L.J. Principles of instructional design. York: Holt, Rinehart & Winston, Inc., 1974, pp. 159-181.

In this chapter, the authors suggest several ways to assess the extent to which students have acquired the capabilities the instruction was designed to teach them. A close correspondence between test items and course objectives is emphasized.

Gronlund, N. Preparing criterion-referenced tests for classroom instruction. New York: MacMillan, 1973. (55 pp.)

Presents a rationale for and methods of implementing criterion-referenced testing in which students' achievement is assessed relative to some objective criterion (usually well-stated instructional objectives) rather than to the performance of fellow students.

Mager, R.F. Measuring instructional intent. Belmont, California: Lear Siegler, Inc./Fearon Publishers, 1973. (159 pp.)

A self-instructional book which stresses the importance of matching type of assessment to instructional objectives.

Pascal, C.E., & Geis, G.L. An outline of methods of grading student performance. Learning and Development, 1974, 5 (5)

The article discusses the relative merits of three alternative grading systems (traditional A-F, pass-fail, and mastery model) and provides a good list of references.

Wilson, S.R., & Tosti, D.T. Learning is getting easier. San Rafael, California: Individual Learning Systems, Inc., 1972, pp. 103-110.

A brief discussion of alternative systems of grading.

19. Evaluation Procedures

McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 124-135.

In his chapter on examinations, the author discusses different kinds of test items and the importance of making clear to students the rules-of-the-game as far as testing is concerned.

20. Testing What is Taught

*Briggs, L.J. Handbook of procedures for the design of instruction. Pittsburgh, Pennsylvania: American Institutes for Research, 1970, pp. 46-71.

This chapter covers a variety of testing issues from constructing items in keeping with stated behavioral objectives to scoring the test and assigning grades.

Eriksen, S. Motivation for learning. Ann Arbor, Michigan: University of Michigan Press, 1974, pp. 194-218.

In this chapter, the author discusses the dual purpose of testing, as an aid to the teacher as well as to the student, different methods of testing, and alternative models of grading.

Green, J.A. Teacher-made tests (2nd ed.). New York: Harper and Row. 1975, pp. 1-41.

A thorough discussion of planning tests which coincide with an instructor's learning objectives. Later chapters give more detailed information on how to construct and use various test forms including performance tests.

McKeachie, W.J. Teaching tips. Lexington, Massachusetts: D.C. Heath and Co., 1969, pp. 124-150.

A full treatment of the testing issue including a consideration of different types of tests, scoring the test, returning test papers, and assigning grades.

Shore, B.M. Guide to resources on objectively-scored teacher-made tests. Learning and Development, 1972, 4 (4).

An annotated bibliography listing books and articles on testing.

21. Evaluation as Feedback

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 99-105.

Discusses how continuous evaluation can provide information useful to both student and teachers.

Gronlund, N.E. Constructing achievement tests. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968, pp. 1-12.

The first chapter of this book discusses testing as an integral part of the learning process, providing feedback for both teacher and student.

Pascal, C.E., & Geis, G.L. Feedback and learning. Learning and Development, 1970, 2 (4).

The authors discuss the principle of feedback: how it works and how to utilize it more effectively to promote student learning.

22. Amount learned

The most direct way to measure the effectiveness of instruction is to measure how much students learn. The following references address themselves to this issue.

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974, pp. 111-120.

Donald, J. The evaluation of learning. Learning and Development, 1976, 8 (2).

Roid, G.H. Learning about ratings vs. rating learning. Learning and Development, 1971, 3 (4).

ALPHABETICAL BIBLIOGRAPHY OF LEARNING RESOURCES

Learning and Development is a newsletter published by the Centre for Learning and Development, McGill University. Also available at the Centre are the following books:

Beard, R. Teaching and learning in higher education. Middlesex, England: Penguin Books, Ltd., 1970. (222 pp.)

Briggs, L.J. Handbook of procedures for the design of instruction. Pittsburgh, Pennsylvania: American Institutes for Research, 1970. (206 pp.)

Brilhart, J.K. Effective group discussion (2nd ed.). Dubuque, Iowa: Wm. C. Brown, 1974. (185 pp.)

Cohen, A. Objectives for college courses. Beverly Hills, California: Glencoe Press, 1970. (140 pp.)

Davis, J.R. Teaching strategies for the college classroom. Boulder, Colorado: Westview Press, 1976. (136 pp.)

Davis, R.H., Alexander, L.T., & Yelon, S.L. Learning system design. New York: McGraw-Hill, 1974. (342 pp.)

Deterline, W.A., & Lenn, P.D. Coordinated instructional systems. Palo Alto, California: Sound Education, Inc., 1972. (94 pp.)

Donald, J.G. Modular instruction: A resource book. Montreal: McGill University, Centre for Learning and Development, 1977. (72 pp.)

Eriksen, S.C. Motivation for learning. Ann Arbor, Michigan: University of Michigan Press, 1974. (259 pp.)

Gagné, R.M. Essentials of learning for instruction. Hinsdale, Illinois: Dryden Press, 1974. (164 pp.)

Gagné, R.M., & Briggs, L.J. Principles of instructional design. New York: Holt, Rinehart, and Winston, Inc., 1974. (270 pp.)

Green, J.A. Teacher-made tests (2nd ed.). New York: Harper & Row, 1975. (211 pp.)

Gronlund, N.E. Constructing achievement tests. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968. (118 pp.)

Gronlund, N.E. Preparing criterion-referenced tests for classroom instruction. New York: MacMillan, 1973. (55 pp.)

Johnson, R.B., & Johnson, S.R. Assuring learning with self-instructional packages. Don Mills, Ontario: Addison-Wesley, 1973. (140 pp.)

Kemp, J.E. Instructional design. Belmont, California: Lear Siegler, Inc., 1971. (130 pp.)

Mager, R. Preparing instructional objectives. Belmont, California: Lear Siegler, Inc., 1962. (60 pp.)

Mager, R.F. Developing attitude toward learning. Belmont, California: Fearon Publishers, 1968. (104 pp.)

Mager, R.F. Measuring instructional intent. Belmont, California: Lear Siegler, Inc./Fearon Publishers, 1973. (159 pp.)

McKeachie, W.J. Teaching tips: A guide book for the beginning college teacher. Lexington, Massachusetts: D.C. Heath and Co., 1969. (280 pp.)

Russell, J.D. Modular instruction. Minneapolis: Burgess Pub. Co., 1974. (134 pp.)

Thornton, J.W., & Brown, J.W. (Eds.). New media and college teaching. Washington, D.C. : National Education Association, 1968. (184 pp.)

Tyler, R.W. Basic principles of curriculum and instruction. Chicago: University of Chicago Press, 1949. (128 pp.)

Vargas, J. Writing worthwhile behavioral objectives. New York: Harper and Row, 1972. (175 pp.)

Wilson, S.R., & Tosti, D.T. Learning is getting easier. San Rafael, California: Individual Learning Systems, Inc. (188 pp.)

Available from the McGill library are:

Ausubel, D.P., & Robinson, F.G. School learning. New York: Holt, Rinehart, and Winston, Inc., 1969. (691 pp.)

Bruner, J. The process of education. Cambridge, Massachusetts: Harvard University Press, 1960. (270 pp.)

SUPPLEMENTARY STUDENT FORM AND INSTRUCTIONS FOR USE

STUDENT EVALUATION FORM

Record how you would describe this course by placing a number in the box next to each item. Use the following code:

1 This is done very well
2 This is done fairly well
3 Not applicable to this course
4 This could be done better
5 This could be done much better

☐ 1. At the beginning of the course, we were given a clear indication of how the course would be organized.

☐ 2. The instructor told us what we could expect to learn as a result of taking this course.

☐ 3. At the beginning of the course, the instructor determined what skills and abilities we brought to the course.

☐ 4. The instructor began by giving a brief outline of the main ideas or general themes to be encountered in the course.

☐ 5. The course material reflects what the instructor told us we could expect to learn from the course.

☐ 6. As the course progressed the instructor explained how course topics are related to each other and to the main ideas in the course.

☐ 7. The amount of material covered in this course is appropriate to the amount of time a student is expected to spend on the course.

☐ 8. I find the course material challenging, but not overwhelming.

☐ 9. There is variety in the examples and applications of material to provide interest for all students.

☐ 10. The instructor provides a brief agenda at the beginning of each class.

☐ 11. The instructor gets information about how well we understand the material being presented and adjusts the rate of presentation accordingly.

☐ 12. The instructor uses different ways of presenting material according to what is being taught.

☐ 13. In lectures or discussions, the instructor uses questions and other strategies to encourage us to actively respond to the material.

☐ 14. There is ample opportunity for us to actively participate in the operation of the course.

☐ 15. We are encouraged to pursue special interests in this course.

☐ 16. The instructor makes time available for those of us who wish to consult.

☐ 17. The text and other learning materials for this course clarify and highlight material presented in class.

☐ 18. When necessary, the instructor creates supplementary learning materials.

☐ 19. At the beginning of the course, we were told how our work would be evaluated.

☐ 20. On tests the instructor gives questions which correspond to what we have been taught.

☐ 21. The instructor uses test results to see where students need extra help.

☐ 22. The instructor is interested in knowing how much we have learned from the course.

HOW TO USE THE STUDENT EVALUATION FORM

The student evaluation form has been developed to complement the instructor self-evaluation form. Students can often provide a different perspective on teaching and using student evaluation in conjunction with self-evaluation gives a more comprehensive picture of an instructor's strengths and weaknesses. If you use this form, make sure that you fill out the self-evaluation form before you look at the results of the student evaluation.

Administering the Questionnaire

The page on which you find the student evaluation form has been perforated so that you can remove it, make copies and distribute it to your students. If you plan to tabulate the results by hand, have the students follow the directions as printed. If it is possible to make use of computer facilities for scoring and analysis, it may be necessary to modify the instructions, for example, to have your students respond on computer cards. Consult your local computer facility for assistance.

To ensure that you get valid information:

1. Students should be allowed to remain anonymous. Do not ask them to sign their names: Do not circulate around the room while they are responding. Some instructors actually leave the room, and have an assistant or a student supervise the administration.

2. The questionnaire should be administered during the middle third of the course.

3. Try to pick a typical class for administration, for example, not immediately before or after a test. Administer the form at the beginning of the class.

Analyzing the Data

If you are analyzing the data by hand, leaf through the questionnaires, tabulating the number of 1's, 2's, 3's, 4's, or 5's, for each item on Table 1. Then fill in the totals on Table 2, and convert them to percentages. These pages have been perforated for easy removal. Draw a circle around the highest percentage in each row as in the example. This is the mode, or most frequently occurring response.

Interpreting the Data

The modes will show you where the important trends are. In the example used in the tables, it appears that the majority of students have responded with either 1 or 2, a positive rating. In looking at your own data, you may well find that the responses tend to accumulate on the positive side (in columns 1 and 2). Research has shown that students tend to answer questionnaires favorably.

To find areas which need improvement, scan columns 4 and 5 to find those items which have higher percentages. The percentage itself may not be very large, but you will likely find a few that stand out from the others. These represent items on which your students feel some improvement could be made. Add these items to those you have already identified for yourself on the Analysis Sheet (p. 7).

Comparison of Self-Evaluation and Student Evaluation

To compare your self-evaluation responses with the responses of your students, use Figure 1. The numbers along the baseline or horizontal axis of the graph represent the item numbers. The numbers along the vertical axis are the possible responses (1 for "done very well," 2 for "done fairly well," etc.).

1. For each of the 22 items, plot your own response from your self-evaluation form (1, 2, 3, etc.) using a cross (x). Connect these points to get your own profile of responses.

TABLE 1: Recording Results of Student Evaluation

Use the table below to tabulate your raw data in this manner:

Example:

ITEM	1	2	3	4	5	Omitted
7	𝍸 𝍸 𝍸 𝍸 II	𝍸 𝍸 𝍸	𝍸 𝍸	III	I	II

ITEM NUMBER	1	2	3	4	5	Omitted
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

TABLE 2: Summarizing Results of Student Evaluation

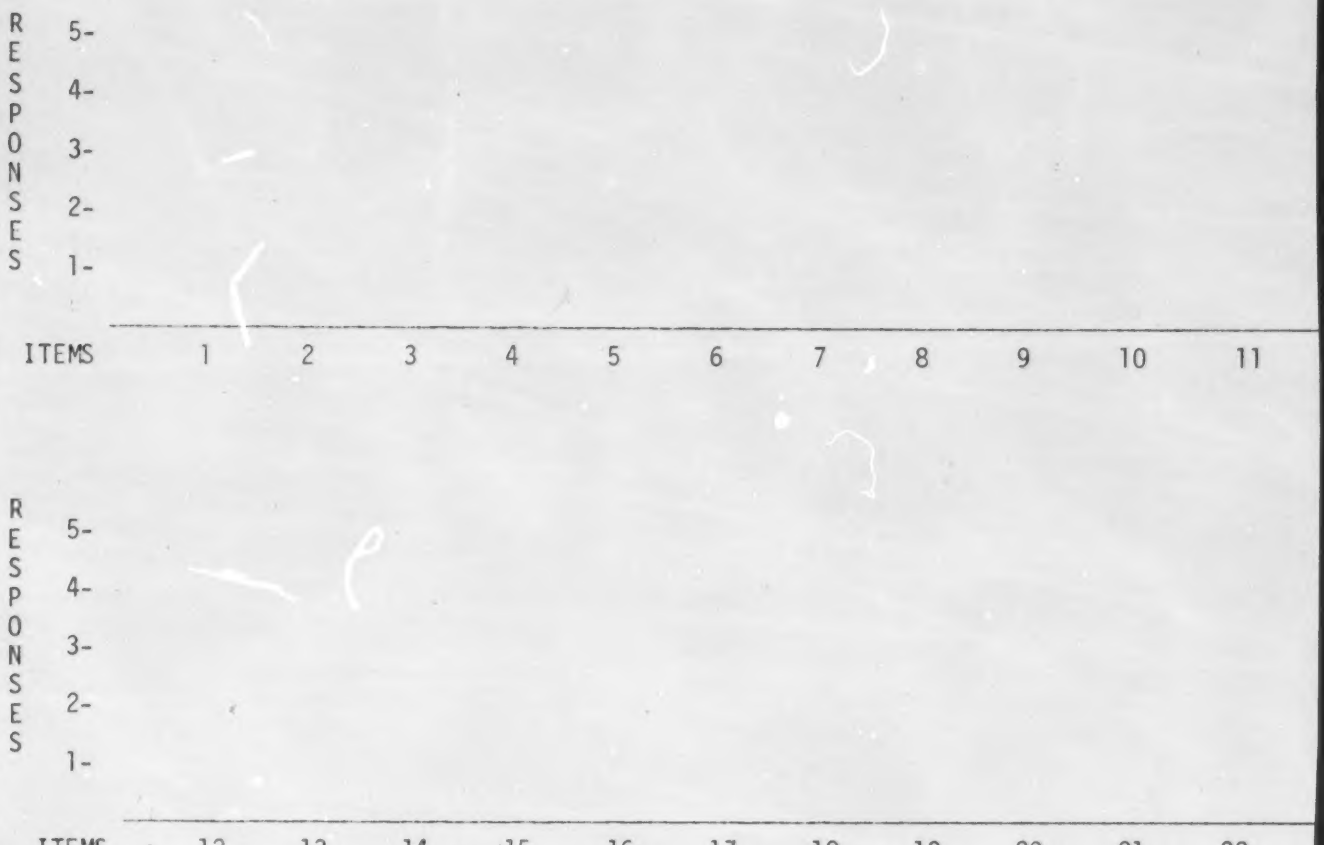
Transfer from Table 1 the totals in each category and calculate the percentages using the total for each row. Circle the highest percentage in each row as in the example.

Example:

ITEM	1		2		3		4		5		Omitted		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
7	22	(41.5)	15	28.3	10	18.9	3	5.7	1	1.9	2	3.8	53	100.1

ITEM NUMBER	1		2		3		4		5		Omitted		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														

FIGURE 1: Comparing Student Evaluation With Self-Evaluation



2. Next plot the mode of your students' responses for each item, that is, the response which occurred most frequently (from Table 2). Use some other symbol (e.g., a circle) and connect these points. Sometimes, there will be two modes, for example, 40% of the students might respond 1 and 40% respond 4. This item deserves closer examination, and may merit discussion with the class to determine why such differences in viewpoint exist.

3. Study the figure to determine which items you and your students agree on, and which ones you disagree on. From studying the discrepant ones, you may decide to add more items to your Analysis Sheet (p. 7) for course improvement purposes.